

EXHIBIT A

ORIGIN AND CAUSE ANALYSIS
256 WESTFIELD STREET
DEDHAM, MA
DOL: 12/20/2002
PREPARED BY: THOMAS J. KLEM, CFI (IAAI)
FIRE PROTECTION ENGINEER, MScFPE
T. J. KLEM AND ASSOCIATES, LLC
24 ROBERT ROAD
STOUGHTON, MA 02072
(781) 344-1115
JULY 29, 2005

Background, Building Construction, Fire Incident, Fire Growth, Development and Spread

T. J. Klem and Associates, LLC has been requested by attorney Daniel Harrington of Cozen O'Connor to submit a report of our findings for this Dedham, Massachusetts fire loss. Thomas J. Klem, principal of T. J. Klem and Associates and author of this analysis, conducted several on-site visits to the property and examined the evidence removed from the fire scene. This analysis is also based upon the review of relevant fire protection literature (listing attached), and upon my education, training and more than thirty years of experience in conducting fire protection analyses of fire incidents (see attached resume that also includes a listing of my publications and cited cases on which I have served as an expert witness). Especially relevant in the fire protection analysis of this fire incident is that I am a certified fire investigator through the International Association of Arson Investigators (IAAI), a fire protection engineer (M. S. Fire Protection Engineering, Worcester Polytechnic Institute) and one of the authors of a fire investigative protocol comprising the National Fire Protection Association's fire investigative protocol, NFPA 921, "Guide for Fire and Explosion Investigations" and one of the NFPA in-house technical reviewers of the first-to-be-published draft document.

On December 20, 2002, the Dedham, Massachusetts Fire Department received notification of a fire at 256 Westfield Street in Dedham. The Westfield Street property is a multi-acre, single-family dwelling, estate setting, having a large three-story brick

residence (main house) and accompanying out buildings for various storage and maintenance uses. The fire was reported to be in the carriage house, the largest of the auxiliary buildings, once used as a motor garage, and more recently being converted to living space by the current property owner, Mr. Roger Marino. At the time of the fire the building was in the final phase of an extensive renovation project. Most all of the major construction had been completed but various "trades" were completing their "finishing touches" to the soon to be fully completed carriage house. Inclusive of this finish work about the time of the fire was hardwood floor sanding and staining, tile work in bathrooms, exterior deck work and finish work in the kitchen (i.e. setting of the kitchen sink and installing dishwasher, etc.) Of the relevant work the working day before the fire included the plumber in the kitchen (setting sink, connecting the dishwasher, etc.), during the afternoon until the end of the workday on December 19, 2002; the job superintendent "in and out of the kitchen" (working on an exhaust fan placement in the kitchen) and his doing exterior porch work; finish floor work (sanding and staining) in the game room, and tile work in the basement level women's shower. The job superintendent, Kraig Magnussen, described the final minutes of the workday (description beginning at approximately 4:00 pm) as sweeping the kitchen floor and assisting the plumber, Alfred Kemp putting a drop cloth under the sink. Mr. Magnussen further described that he checked to see if the painters had placed their rags (used in the staining process) in buckets of water and if they had placed them on the exterior of the building. Mr. Magnussen found a bucket containing water and rags in the foyer that night and indicated that he removed them from the building and placed the bucket along the masonry brick wall of the kitchen. (Remains of this bucket and rags were found during our on-site examination/investigation of the fire. In addition, other buckets containing water and rags were also found even further away from the building during our investigation.) Mr. Magnussen then reported that he turned on lights in the entrance

foyer (but dimmed them), and locked the building. Mr. Magnussen reported that he had secured the carriage house at approximately 4:15 pm that day. (Also see later details.)

The carriage house is a three level, Type III building built at the turn of the century. It has brick exterior walls with wooden interior studs, joists and roof framing. The roof was covered with slate shingles. The building did contain a fire detection system but it was not fully functional at the time of the fire. Walls lining the perimeter of the building were insulated with fiberglass batts in each 2x4-inch stud bay. The insulation was covered with a polyethylene vapor barrier. Gypsum wallboard was applied to the interior walls and finished with a variety of paint, tile, and wallpaper coverings. The lower level of the carriage house consisted of mechanical rooms for heat, electricity, and hot water as well as his and her cabana rooms, having a steam and sauna area. A grand, wooden curved stairway (prominent within the entrance foyer) provided access to upper floors from the basement. The basement ceiling and first floor construction assembly was poured, reinforced concrete. There was little fire damage in the basement except for some drop down fire around the central stairway.

The first floor had a center entranceway into a foyer where the curved stairs led up to the second floor and down to the basement. To the right of the foyer were two rooms; a kitchen, closest to the front of the building, and a sitting area with a fireplace at the right rear. To the left and rear were an open entertainment area, and a large exercise room. The first floor damage was concentrated in the right front quadrant, mainly in the kitchen. There was less damage to the rest of the first floor.

The second floor was built upon wooden floor joists supported by both wooden and steel beams. Upstairs renovations were made to create office space, a meeting room, and guest sleeping area with a bathroom. The most significant fire damage to the second floor was also to the right front quadrant, above the kitchen. The wooden floor joists in this area also served as the kitchen ceiling framing and many of the large beams

had been completely consumed by the fire. This, we noted, was the only area where any floor framing was completely consumed. (During the analysis of the growth development and spread of the fire it was determined that the fire moved above the second floor ceiling via combustible, concealed or void spaces. See later description.)

The fire was first discovered by Mr. Marino early in the morning on Thursday, December 20, 2002. Mr. Marino first described the extent of the fire as "up through the roof" of the carriage house and in the kitchen area. He then reported that he mistakenly dialed 411 but then called the caretaker of the property Robert Cullinane, whose residence was positioned at the base, entranceway to the Marino property. Mr. Cullinane, the former fire chief of the Dedham Fire Department, then called the fire department and their dispatch occurred at 2:24 am. While the fire department was responding, Mr. Marino described the fire as being in the middle of the building and above the kitchen. Mr. Marino approached the carriage house, made visual contact with Mr. Cullinane and then returned to the main house to retrieve a camera and upon his return to the outside began to take a series of photos of the carriage house burning (see sequence of photos attached to this report.) Both Mr. Marino and Mr. Cullinane estimated that the fire department arrived within five minutes of their dispatch.

When Dedham fire apparatus arrived on scene, fire was concentrated at the right, front of the building, with flames coming from the first and second floor windows, and some fire venting from the roof around two of the three front roof dormers. A defensive, exterior attack was initiated and continued until the fire was knocked down. Because of potential structural collapse hazards, little interior firefighting was done, and pockets of fire burned, mostly on the second floor, until final extinguishment.

Fire Investigation/Propagation within the Carriage House/Analysis

Thomas Klem was notified of this loss by Mr. James Tagliante, General Adjuster for Chubb and Son, insurers of the Marino property. Mr. Tagliante requested Mr. Klem

conduct an origin and cause analysis. Subsequent to this notification, not only was a several day, on-site documentation and analysis conducted, but this analysis also included an on-site assessment by electrical engineer Donald Galler. In addition, interested parties were provided access to the site and several additional days were spent documenting the fire scene and their participating in the evidence collection. Further, subsequent to the on-site phase, plumbing expert Lester MacLaughlin examined the retained kitchen sink arrangement and even later yet Mr. Galler conducted additional examinations of the electrical components from the kitchen of the carriage house.

Tom Klem and investigator Kevin Murphy met on scene with State Fire Marshal's representative, Francis McGinn on December 23, 2002, three days after the fire to initiate our investigation of the fire. Trooper McGinn had begun an origin and cause investigation with Dedham fire investigators the day of the loss, and agreed to meet us on-site and to brief us on the progress of the public sector investigation. Trooper McGinn and Mr. Klem agreed to examine the fire scene together and to be present during interviews of witnesses. The public sector investigation on the day of the fire, we were told, included fire scene documentation (photos taken by Lt. John Fontaine, Dedham Fire Department and those taken by Trooper Laurie Covino of Massachusetts State Police Crime Scene Services). Further, it was reported to us that Trooper Elkin Arrendondo and AK-9 Webster screened the fire scene. Trooper McGinn reported, "no accelerants were detected." Finally, it was reported that Trooper Mark Varkas assisted in the initial investigation and that interviews of Mr. Marino, Mr. Cullinane, Mr. Magnussen, Larry Dickens (doing tile work), and Alfred Kemp and Phil Shields both of Sanborg Plumbing (plumbers working the day before the fire) were conducted on the day of the fire.

We reviewed the Marino photos with Trooper McGinn and assessed their relevance in the documentation of the fire after discovery. Mr. Marino's photos were used to provide the investigators indicators as to the origin of the fire. Reviewed in the order that they were taken, the Carriage House appears to get larger in the photos as Mr. Marino approaches (as would be the case). First photos show fire inside the kitchen and to a lesser degree, in the foyer. A larger volume of flames are observed coming from the roof dormer directly above the kitchen. The middle dormer is intact and not on fire. The fire in the kitchen is assessed and determined to be in the "decay stage" of burning as the sequence is documented. It was later determined through physical evidence that the fire had vented from the large kitchen window, burning the gutter and wood soffit at this location (no other location of the soffit had such burning damage). This unique, severe burning is an indicator, in this case, of the area of fire origin and one of the fire spread mechanisms to account for the spread to the second floor (also see later identified mechanism).

Further, the analysis of the "Marino photos" indicates that the fire in the kitchen seems to have burned longer closer to the center of the house. The large kitchen window overhead support is held up by two vertical framing members. During progression of the fire the Marino photos show that the vertical support closest to the center of the building burns away first, indicating longer exposure (since the fuel package within the kitchen was equally distributed) to flame and suggesting an earlier ignition to the right of the kitchen sink (orientation from within the kitchen proper).

Later during the investigation an additional fire spread mechanism (and more significant) to the second floor was determined to be the combustible concealed spaces behind the kitchen wall that also allowed vertical fire spread (through the interior of the building) up into the second floor (see later discussion). In summary, the Marino photos

confirm fire extension to the second floor above the kitchen and the decayed state of burning in the kitchen of the carriage house.

In addition to the analysis of these first documentation events of the fire, our investigators conducted our on-site analysis of the carriage house using standard fire investigative protocols (see NFPA 921, *Guide for Fire and Explosion Investigations*, e.g.) Our discussions with Trooper McGinn provided our understanding of the extent of the "public sector" investigation (i.e. interviews, photos taken, etc.) and any preliminary fire scenarios, etc. We continued our on-site investigation using a standard exterior examination procedure and then we conducted a detailed interior analysis of fire-damaged areas and established interior and exterior methods of fire extension and fire travel about the carriage house. Since the building was not fully furnished at the time of the fire, our initial assessments also included building and/or finish materials that could account for (or were assessed for) the growth development and spread of the fire. In addition, since the building was undergoing extensive renovations at the time of the fire and had various "trades people" within the building the day before the early morning fire, potential ignition aspects of the renovation process were examined for their relevance as well (i.e. smoking materials, forced entry, hot work, etc.). Finally, building construction aspects of the carriage house were assessed using the building plans as well as the on-site observations of construction features by our investigators. From this approach we developed various ignition, fire growth and spread hypotheses and our investigators, using their experience, training and formal education tested their relevance using scientific principles of ignition, fire propagation and fire spread. Further discussions with fire officials, interviews with the property owner, caretaker, job superintendent and the workers within the carriage house the day before the fire (with the exception of Mr. Kemp) were also part of our initial, on-site investigative process as well.

This scientific based approach to this investigation led our investigators to establish the kitchen as the area of fire origin. (Their independent assessment of the fire scene also led the public sector investigators to this area of origin as well.) The kitchen was observed as the most extensively fire damaged area of the building, and was documented/assessed in the Marino photos as in the decay phase of burning during the discovery process.

Further, a more detailed examination of the kitchen revealed more fire damage to the right of the sink (facing the exterior south wall {assigned as such for this analysis} of the carriage house), and second floor damage that was consistent with vertical fire spread from this area (and as supported by the Marino photos). Upon further review of the kitchen we observed a complete loss of the wooden cabinets to the right of the sink and dishwasher. Adjacent to the dishwasher the mass loss to the wooden wall studs and a kitchen cabinet was nearly complete. Moving to the right, further from the sink, the amount of consumption decreased, giving us a preliminary, initial directional fire spread pattern. Upon further examination and assessment of this general area, and closer to the kitchen sink location, we would establish several additional indications of the initial fire growth and spread patterns that also indicated directional fire patterns. (See later discussions.) Further at this point, we observed that the kitchen sink and cabinet remained but were also severely damaged. The metal sink had collapsed into the base of the cabinet. Upon further examination we noted that the PVC drain pipe in the wall behind the cabinet was damaged in a way that indicated more burning and mass loss of the drain pipe closer to where it would eventually connect to the sink (connection not complete at the time of the fire). Further along the pipe, we observed consistent fire damage patterns as the pipe extended to the back of the cabinet and ultimately as it connected to the kitchen drain (see attached photos). At this location the combustible wall space consists of the PVC pipe, thermal insulation, and a polyethylene vapor barrier

that runs horizontally and covers the entire wall stud bays to the right (and left) of the sink. The entire run of PVC pipe from the intended connection of the sink, through the stud space and then down to the kitchen floor, again, showed fire damage and initial directional fire spread patterns uniquely stemming from the area under the sink of the kitchen. Reconstruction/documentation of the sink area and analysis by our investigators shows that there is a hole (opening) located in both the wooden cabinet and the exterior plywood portion of the combustible wall framing (there are other penetrations or plumbing pipes, etc., within the back of the cabinet as well). Considering the location of this hole to combustibles and that the wall assembly was a combustible void space leading to the second floor area, a competent heat of ignition (i.e. such as an open flame in this area) could easily ignite the combustible materials located there. In addition, a folded cotton "drop cloth" was found stored at the base of the sink cabinet that was fire damaged. The drop cloth "protected" the base area of the cabinet congruent to its position. Finally, in this general area we documented that the damage to the underside of the plastic base of the dishwasher was more burned and melted at the rear of the dishwasher, suggesting heat exposure at the rear and supporting an initial fire spread mechanism/burning within the combustible wall assembly behind the sink. Electrical conductors ran behind the cabinets to provide power to various kitchen appliances and wall outlets. The appliances had not yet been installed and no known "electrical load" was running on these kitchen circuits. Initial examination of the kitchen electrical components by our investigators was followed by a more thorough on-site exam by Mr. Donald Galler, electrical engineer retained by T. J. Klem and Associates. Mr. Galler also examined these and other various electrical components taken into evidence from the kitchen at a later date. Mr. Galler concludes that there is no technical basis for an electrical fire cause in the established area of fire origin (see Mr. Galler's separate report of his findings.)

Other ignition scenarios for the kitchen area were also considered such as spontaneous ignition of stained rags, but the facts, physical evidence and witness testimony did not support further consideration of these scenarios upon final analysis. First, for example, the painters were not working in the kitchen the day before the fire. Next, we observed and documented paint-type rags submerged in water at the locations indicated by both the painters and the renovation job superintendent, Mr. Magnussen. Further, in the consideration of other ignition scenarios, all workers interviewed consistently indicated to us that no smoking was allowed in the building and we saw no remains of smoking materials, in any part of the carriage house that would support any other determination. As a result of our determinations, observations and other ignition scenario determinations (i.e. consideration and eliminations), we began to focus on an ignition scenario that involved a plumber's torch igniting combustible materials under the kitchen sink (i.e. drop cloth and/or polyethylene vapor barrier, etc.). Such a hypothetical ignition scenario (at this point) was determined to be consistent with the fire growth patterns documented in this report.

Before ignition, fire growth and spread patterns were further considered, we assessed the statements of Mr. Kemp to Trooper McGinn. It was reported that prior to the fire, plumbing work was being done in the carriage house by Al Kemp and an apprentice, Philip Shields. It was reported that on December 20, 2002, Mr. Kemp had stated that only "finish plumbing" work was done on Thursday, the day prior to the fire. This work would involve making only mechanical connections, and did not require the use of a torch to solder fittings. The soldering, Mr. Kemp stated to Trooper McGinn, was done on Wednesday when he shut off the water service for the building, and installed all the piping shut-off valves, or "stops". Our plumbing expert, Mr. MacLaughlin indicates that good plumbing practice would test the connections by turning the water back on. This would later be confirmed in Mr. Kemp's deposition that he did turn the water back